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Agenda item 9

ADOPTION OF THE REPORT OF THE CONFERENCE

Draft report

CHAPTER III

WORK OF COMMITTEE I: REVIEW OF THE LATEST TECHNOLOGY IN CARTOGRAPHIC DATA ACQUISITION, MANIPULATION, STORAGE AND PRESENTATION, WITH SPECIAL EMPHASIS ON POTENTIAL APPLICATION IN DEVELOPING COUNTRIES

1. Committee I considered the following topics: Conventional and satellite geodesy, including Global Positioning Systems (agenda item 5 (b)), Remote sensing for cartography (item 5 (c)); Hydrographic surveying and nautical charting (item 5 (e)); and Cadastral surveying and mapping (item 5 (g)). The Committee reviewed 10 papers dealing with these topics. _____ draft resolutions were submitted to the Conference and subsequently adopted by the Conference as resolutions ____, ____, ____ and ____ (for the text of the resolutions, see chap. ___ below).

A. Conventional and satellite geodesy

2. The United States of America submitted a paper entitled "Marine applications of the Global Positioning System" (E/CONF.86/WP.11). The paper described the various possible applications of the NAVSTAR Global Positioning Systems (GPS), with special emphasis on marine navigation, mapping and charting, geodetic and geophysical applications. The paper also included 12 tables with current applications of GPS.

3. The United Nations Secretariat presented a paper entitled "La télédétection aux fins de la cartographie, topographique et thématique" (E/CONF.86/BP.3). The presentation was an overview of the basic concepts of geographic information, digital images and spatial applications. The particular problems of resolution and location, according to the type and nature of various objects analysed were also addressed, making it clear that currently no civil satellite fully satisfied the specifications for classic maps. Therefore, the emphasis should be placed on special applications such as thematic cartography.

4. Ecuador presented a paper entitled "G.P.S. en el Ecuador" (E/CONF.86/WP.18), describing in detail the establishment of the national geodetic control network based on GPS. Special problems deriving from the topography of Ecuador that affected the performance of GPS were also addressed. The work started in 1991 and it is being performed by the Instituto Geográfico Militar of Ecuador.

5. Canada submitted a paper entitled "From National to Global: the Changing Focus of the Geodetic Survey of Canada" (E/CONF.86/WP.19), describing the current activities of the Geodetic Survey Division of Canada, and the products and services offered to domestic and foreign clients. It emphasized that special mention should be made of the definition and readjustment of survey control networks referenced to the North American Datum 1983 (NAD'83).

6. Germany presented a paper entitled "EUREF - A Modern Geodetic Approach to Establish an All-European Reference System" (E/CONF.86/WP.26), giving a detailed description of the necessity for a new European Terrestrial Reference System capable of satisfying the demanding needs of geodesy and digital cartography. Earlier solutions and WGS-84 were also reviewed, together with a description of the densification campaign devised to establish EUREF-stations, which were to number approximately 300 and be located up to a maximum of 500 km apart from each other, and which would need about 92 GPS observation sites. The EUREF design will provide several transformation parameters, including WGS-84.

7. The United States of America submitted a paper entitled "The North American Vegetation Index Map Using Advanced Very High Resolution Radiometer Data Sets" (E/CONF.86/WP.5), describing the methodology used to prepare a vegetation map of North America using satellite data. This type of cartographic map had proven useful in controlling insect damage to agriculture, monitoring fire danger conditions in forest and grassland and in forecasting potential impacts of climate change. The paper also discussed the need for application in developing countries.

8. Canada presented a paper entitled "Canada's Tropical Forestry Initiative in Latin America - An Airborne Synthetic Aperture Radar (SAR) Program" (E/CONF.86/WP.13), outlining the aims and objectives of the Tropical Forestry Initiative research programme in Brazil, Costa Rica and Venezuela and highlighting the preliminary results of some of the data, their interpretation and comparison with ground verification information. C-Band airborne radar

was used mainly to test SAR airborne data capability to differentiate between different types of tropical vegetation classes through visual analysis and digital image processing, but also to determine reservoir land-water boundaries under forested areas, and to evaluate the capability of SAR data in different configurations to discriminate between different rock types and geological structures.

9. Canada presented a paper entitled "Cartographic applications of remote sensing for the Americas at the Canada Centre for Remote Sensing" (E/CONF.86/WP.23), describing the many projects being managed at the Centre, several of them in cooperative work with other American countries. Projects highlighted were the Topographic Mapping in Costa Rica from SAR Data using Digital Video Plotter to extract planimetric and altimetric features from stereo SAR data, the RESORS (servicio del Sistema de Recuperación en Linea y Descripción de Productos), which is a bibliographic database devoted to remote sensor data, and the Cartography and Remote Sensing Orbital Systems, which use Multispectral Scanners to scan the ground in linear strips across the orbital path, independent of solar illumination and clouds.

10. The United States of America submitted a paper entitled "The Coast and Geodetic Surveys' nautical chart rescheming plan" (E/CONF.86/WP.8), describing the necessity to standardize the scales of charts in accordance with international specifications, to standardize chart paper sizes, using A0 or derived sizes, and to standardize chart projections, seeking goals such as reducing the number of total charts managed by the survey. It also discussed the incorporation of requests for changes to the nautical charts by mariners in the private and government sectors, and the international standardization and cartographic simplification proposed by the International Hydrographic Organization.

11. The International Federation of Surveyors presented a paper entitled "Cadastral reform: building the infrastructure for sustainable development" (E/CONF.86/WP.34), highlighting the broad role that the cadastre plays in land management and the need for cadastral reform. Some challenges for the future were identified, such as (a) incorporating new types of tenure interests, which would require that the focus of the cadastre be the land itself rather than the legal procedures; (b) building an information infrastructure and seeking the coordination of jurisdictional cadastral projects in order to proceed incrementally in the development of effective land administration and land management; action, and (c) developing more effective land administration arrangements, thus seeking the management of the entire land tenure systems. In this way, the cost and delays of a fragmented land administration could be significantly reduced.

CHAPTER IV

WORK OF COMMITTEE II: CARTOGRAPHIC DATA MANIPULATION

12. Committee II considered the following agenda items: Automatic cartography: development and application of digital cartographic databases, including digital terrain modelling (item 5 (j)); Land/geographic information systems (item 5 (k)); and Map updating (item 5 (l)). The Committee reviewed 11 papers under item 5 (j) and 5 papers under item 5 (k). No paper was submitted under item 5 (j).

A. Automatic cartography: development and application of digital cartographic databases, including digital terrain modelling

13. The Secretariat presented a paper entitled "Spatial data quality standards: a necessity for effective use of digital cartographic databases" (E/CONF.86/BP.6). The paper described five criteria for data quality: lineage, positioned accuracy, attributive accuracy, completeness and logical consistency. The paper also presented the works of the Commission on Spatial Data Quality, created by the International Cartographic Association in 1990.

14. Finland presented a paper entitled "Development of the topographic data system in Finland" (E/CONF.86/L.4). The paper explained how the National Land Survey had upgraded the methods of topographic map production. The paper described the topographic data system, the collection and updating of topographic data, the topographic database, its products and the development of the topographic data system.

15. The United States of America presented a paper entitled "U.S. Geological Survey Standards for digital orthophotos" (E/CONF.86/WP.2). The paper presented the characteristics and production methods of the orthophotos. The paper also stressed the role of orthophotos as a source of geographic information, particularly as a tool for revision of data and as a digital layer in a geographic information system.

16. The United States of America also presented a paper entitled "The generation of a prototype USGS 1:24,000-scale topographic map from digital line graph data" (E/CONF.86/WP.4). The paper described the development of processes that led to the production of a fully symbolized colour composite proof of a 1:24,000-scale quadrangle from digital line graph data.

17. The United States of America presented a paper entitled "Toward a feature-based world: making the transition from DLG to DLG-E" (E/CONF.86/WP.6). The paper described how the United States Geological Survey is making the transition from its spatial data model (DLG) to its new feature-based model (DLG-E). The paper explained the enhancements contained in DLG-E and the methods being developed to convert existing DLG holdings to a DLG-E level of content.

18. The United States of America presented a paper entitled "Bridging the gap: creating near-shore bathymetric maps from multibeam swath sonar systems and conventional data" (E/CONF.86/WP.7). The paper explained how additional in-shore data sources were incorporated to supplement the multibeam survey data and provide a complete map depiction.

19. Canada presented a paper entitled "Data standards for the National Topographic Data Base" (E/CONF.86/WP.16). The paper described the characteristics of the data standards, more particularly the data model, the data structure and the data dictionary.

20. Canada presented a paper entitled "Digitizing system for existing topographic maps at the Canada Centre for Geomatics" (E/CONF.86/WP.17). The paper described the methods used to produce digital data from already existing maps and how this technology had become the chief data acquisition method for feeding the National Topographic Data Base.

21. Canada presented a paper entitled "Process for updating the National Topographic Data Base of Canada (E/CONF.86/WP.14). The paper presented the revision process based on overlaying the old file (vector data) and on ortho-image generated from SPOT imagery (recent raster data). The paper described the data preparation, ortho-image creation, field completion and updating steps.

22. Canada presented a paper entitled "Development of the digital cartographic process at Energy, Mines and Resources, Canada" (E/CONF.86/WP.15). The paper described how paper maps were generated from the National Topographic Data Base by fully computerized methods.

23. Chile presented a paper entitled "Desarollo del proyecto sistema de información cartográfico nacional" (E/CONF.86/WP.37). The paper described the implementation of the National Cartographic Information System at the Military Geographic Institute. The conceptualization and implementation processes and the cartographic process were outlined.

B. Land/geographic information systems

24. The Secretariat presented a paper entitled "GIS/LIS latest developments" (E/CONF.86/BP.4). The paper gave an overview of the state of the art and a vision of the progress still to be accomplished. The paper discussed key issues in various GIS/LIS activities and made a brief assessment of the role and nature of GIS.

25. The United States of America presented a paper entitled "The Spatial Data Transfer Standard (FIPS 173): the key to data sharing" (E/CONF.86/WP.3) The paper explained how SDTS would serve as the national spatial data transfer mechanism for all federal agencies. The paper stressed the importance of the acceptance by data users and systems vendors and described the implementation strategy.

26. The United States of America presented a paper entitled "The Digital Geographical Information Exchange Standard (DIGEST) - implementation status" (E/CONF.86/WP.10). The paper provided background information on DGIWG, current implementation of DIGEST - compliant datasets and future activities.

27. The United States of America presented a paper entitled "A product exchange format for the Defense Mapping Agency's vector products (E/CONF.86/WP.12). The paper presented the Vector Product Format (VPF) standard and the various VPF products, namely the Digital Chart of the World (DCW).

28. Spain presented a paper entitled "Sistema de información geográfica (SIG)" (E/CONF.86/WP.22). The paper described the implementation phases of the geographic information system at the National Geographic Institute of Spain. The paper described the following phases: definition of concepts, modelling of the reality and creation of databases.

C. Map updating

29. No paper was submitted under this item.